

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 14506-44090	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/26801	International filing date (day/month/year) 27 August 2003 (27.08.2003)	Priority date (day/month/year) 27 August 2002 (27.08.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): C12 M 1/00 and US Cl.: 435/289.1		
Applicant VANDERBILT UNIVERSITY		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 29 March 2004 (29.03.2004)	Date of completion of this report 12 December 2004 (12.12.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Ann Y. Lam <i>J. Roberts for</i> Telephone No. 571-272-1600

I. Basis of the report**1. With regard to the elements of the international application:***

- ☒ the international application as originally filed.
- ☒ the description:
pages 1-33 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the claims:
pages 34-41, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the drawings:
pages 1-14, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/2680

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-57</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-57</u>	NO
Industrial Applicability (IA)	Claims <u>1-57</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

V. 2. Citations and Explanations:

Claims 1-41 and 50-57 lack novelty under PCT Article 33(2) as being anticipated by Hatschek et al., US 5,489,515A.

As to claims 1, 2, 17-21, 35 and 50-55, Hatschek et al. teaches a bioreactor comprising i. a first substrate (71 and 73) having a first surface, an opposite second surface and edges (see fig. 1); ii. a second substrate (53) having a first surface and an opposite second surface (see fig. 1), defining a cavity (75) with a bottom surface, wherein the bottom surface is located between the first surface and the second surface, and wherein the first surface of the first substrate is received by the second surface of the second substrate to cover the cavity so as to form a channel for receiving cells and a liquid medium (see fig. 1); iii. a recess (see recess between 73 and 71) formed in the second substrate with a bottom surface and in fluid communication with the channel; and iv. a barrier (73a) for covering the recess to form an outer chamber, wherein the barrier has a porosity to allow the channel and the outer chamber in fluid communication and control the move of cells between the channel and the outer chamber.

As to claims 3-5, 8-11, 56, a biocompatible coating layer enhancing cell adhesion is on the surface of the second substrate (col. 2, lines 57-59.)

As to claims 4-7, the flow of liquid is capable of being controlled (col. 9, lines 61-64.)

As to claims 12, 13, 22, the second substrate defines an injection port (col. 9, lines 61-64, and fig. 1.)

As to claims 14 and 15, the channel is capable of allowing a stream of substance comprising chemokine to be introduced (col. 9, lines 61-64.)

As to claims 23, 37, 38, a plurality of electrodes (56, 57, 58 and 59) is disclosed for electrochemical measurements of the host of cells.

As to claims 24, 33, 34, a plurality of ports and channels is disclosed (see fig. 1.)

As to claims 25-27, 36, 41, 57, the first and second substrate is fabricated from glass (col. 8, line 24.)

As to claims 28-32, a plurality of traps (73b, 73c) is disclosed.

As to claims 39, 40, optical sensors (50) are disclosed.

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International application No.
PCT/US03/26801

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Claims 42-49 lack novelty under PCT Article 33(2) as being anticipated by Schwarz et al., US, 4,988,623A.

As to claim 42, 47, Schwarz et al. discloses a bioreactor comprising a first substrate (20), inlet port (3), first connection channel (66), outlet port (86), second connection channel (67), and confining means (35) to form a confinement region.

As to claims 43, 44, the confining means comprises a first (35) and second filter (121).

As to claim 45, an alternate port (see ports near 85, in fig. 2) and third connection channel (see 30, near 85 in fig. 1) is disclosed.

As to claim 46, the first substrate is glass.

As to claims 48, 49, a supporting member (50c) outside the confined region is disclosed.

Claims 1-57 meet the criteria set out in PCT Article (4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.